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SOMATIC CHROMOSOMES OF *NERINE ANGUSTIFOLIA* AND *N. PLATYPETALA*

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Abstract

The somatic chromosomes of two *Nerine spp.* have been investigated. Each has 22 somatic chromosomes. Morphological differences were observed between the f and g chromosomes of the two species. The other chromosomes correspond very closely, suggesting a close relationship.

Uittreksel

SOMATIESE CHROMOSOME VAN *NERINE ANGUSTIFOLIA* EN *N. PLATYPETALA*

Die somatiese chromosome van twee *Nerine* soorte is ondersoek. Elk het 22 somatiese chromosome. Morfologiese verskille is waargeneem tussen die f en g chromosome van die twee soorte. Die ander chromosome toon 'n groot ooreenkoms wat op 'n noue verwantskap dui.

Materials and Method

Bulbs of the two *Nerine species* were obtained from Mr. Gordon McNeil of Dindinnie, Northern Transvaal. These were potted in sand, placed in a shade house and regularly watered with tap water for a period of two months. The plants were then removed from the pots and soaked in tap water to dislodge all sand particles. The young roots were immediately decapitated and the tips immersed for 2 hours in a $\frac{1}{2}\%$ Colchicine solution as recommended by Darlington, and la Cour (1962). The root tips were then fixed overnight in Carnoy prepared according to Johansen (1940) 2nd formula. They were then macerated in $\frac{N}{10}$ HCl and stained in acetic ocrein Darlington, la Cour (1962) for two hours. The excess stain was washed off in a 10% acetic acid solution, squash preparations were made, these were ringed with Canada balsam and immediately inspected.

Drawings were made at table level by means of a Zeiss standard microscope with 100X oil immersion plan objective and drawing tube.

Results

Nerine angustifolia, 22 somatic chromosomes. Fig. 1 a and b. The single pair of long chromosomes are V-shaped with a sub-median constriction and little difference between the length of the two arms. The next 6 pairs, b–g, form a graded series from medium sized with a sub-terminal to a sub-median constriction. The proximal arms of chromosomes b, c and d are approximately

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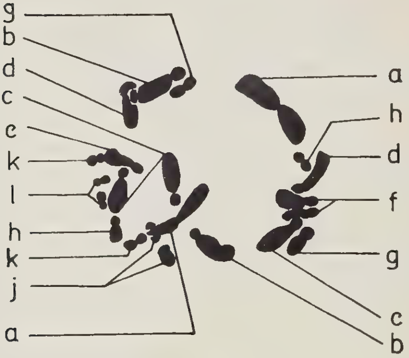

FIG. 1A.
Nerine angustifolia.

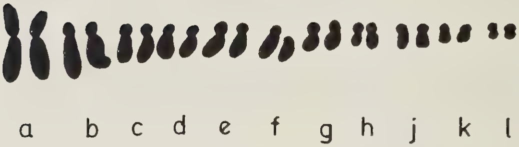

FIG. 1B.
N. angustifolia.

the same size, but each pair is distinct as the distal arms vary in length from the b pair where these are as long as the longer arms of the a pair, to the comparatively short arms of the d pair. The e and f pairs could not be distinguished from one another. They are approximately the same size as the c pair, but distinct from these as their proximal arms are slightly longer. The g and h chromosomes are short with sub-median constrictions but the g pair is slightly longer than the h pair. The h and j pairs again resemble each other very closely as far as the total lengths and the positions of the centromeres are concerned. They could not be distinguished with much certainty from one another. The k and l pairs are almost microchromosomes with the 1 pair the smaller of the two. In fact the two arms are each a small ball with a diameter less than the width of one of the other chromosomes.

Nerine platypetala, 22 somatic chromosomes. Fig. 2 a and b.

The chromosomes of this complex are, on the whole longer than those of *Nerine angustifolia*, but this may be due either to a less advanced metaphase or a slightly shorter Colchicine action. Morphologically the karyotype is much like that of the previously discussed species. The differences observed are the following:

(1) The f chromosomes of *Nerine angustifolia* are J-shaped while those of *N. platypetala* are V-shaped.

(2) The g chromosomes of *N. platypetala* have a secondary constriction in the distal arm with a trabant almost the size of the proximal arm.

The other chromosomes of the two karyotypes are almost identical.

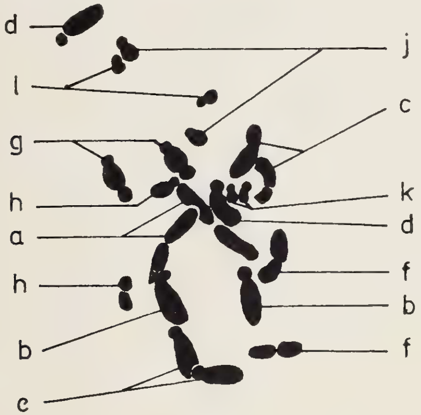

FIG. 2A.
Nerine platypetala.

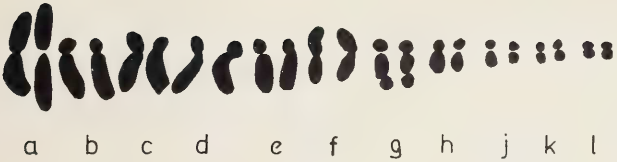

FIG. 2B.
N. platypetala.

DISCUSSION

Apparently the two species have been investigated cytologically for the first time. The 22 somatic chromosomes occur repeatedly in the genus Nerine. Occasionally there seems to be a variation in the number of the short chromosomes cf. Gouws (1949), Heitz (1926) and James and Addicot (1941) and Inariyama (1937). However, the prevalent number seems to be 2n = 22. The karyotypes of the present two species, besides showing a reasonable degree of similarity with those previously investigated, show also a very marked correspondence between their chromosomes except for the f and g pairs as reported above. This seems to show that *N. angustifolia* and *N. platypetala* are closely related but the karyological evidence supports the view that these are distinct species.

REFERENCES

DARLINGTON, C. D. and LA COUR, L. F., 1962. *The Handling of Chromosomes*. London: G. Allen & Unwin Ltd.

GOUWS, J. B., 1949. Karyology of some Amaryllidaceae. *Plant Life* **5**: 54–81.

HEITZ, E., 1926. Der Nachweiss der Chromosomen. *Zeit Bot.* **18**: 625–681.

INARIYAMA, S., 1937. *Sc. Rep. Tokyo Banrika Daigaka Sect.* B, 3.

JAMES, W. M. and ADDICOT, F. J., 1941. Preliminary report on the time of flower formation and chromosome numbers in Nerine. *Herbertia* **8**: 111–116.

JOHANSEN, D. A., 1940. *Plant Micro technique*. New York and London: McGraw-Hill.